

Substance Abuse

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ALCOHOL

Alcohol, the third leading cause of preventable death, is a chronic disease with genetic, psychosocial, and environmental factors influencing its development and manifestations. About 100,000 deaths annually are associated with alcohol abuse and dependence.

The DSM-IV defines alcohol abuse as maladaptive pattern with one or more of the following:

- Failure to fulfill work, school, or social obligations
- Recurrent substance use in physically hazardous situations
- Recurrent legal problems related to substance abuse
- Continued use despite alcohol-related social problems

The DSM-IV defines alcohol dependence as maladaptive pattern with three or more of the following:

- Tolerance
- Withdrawal
- Substance taken in larger quantities than intended
- Persistent desire to cut down or control use
- Time is spent obtaining, using, or recovering from the substance.

Symptoms

- Increased tolerance, blackouts, and memory lapses
- Sleep disturbances, tremors
- Quick drinking and gulping first drink
- Use of alcohol for stress relief
- Frequent thoughts about drinking
- Tardiness or absence from work
- Motor vehicle accident with alcohol involved
- Family problems related to alcohol
- Erectile dysfunction

Signs

- Hypertension
- Cognitive defects
- Peripheral neuropathy
- Cirrhosis of the liver
- Cardiomyopathy
- Pancreatitis
- Wernicke-Korsakoff syndrome



LABS (TABLE 41-1)

Table 41-1. Lab Values

ABNORMALITY	DIAGNOSTIC CHARACTERISTICS
Serum AST>ALT (ratio >2:0, both usually <300 IU/L, and almost never >500)	Sensitivity and specificity not well studied, but may vary with the magnitude of the ratio
Elevated carbohydrate-deficient transferrin (CDT)	Sensitivity ~60%-70%, specificity 80-90%
Elevated serum AST	Sensitivity 50%, specificity 82%
Elevated ALT	Sensitivity 35%, specificity 86%
Elevated GGT	Sensitivity 70%, specificity 60%-80%

ALT, Alanine aminotransferase; AST, aspartate aminotransferase; GGT, gamma-glutamyl transpeptidase.



WITHDRAWAL (TABLE 41-2)

Table 41-2. Withdrawal

SYNDROME	CLINICAL FINDINGS	ONSET AFTER DRINK
Minor withdrawal	Tremulousness, anxiety, headache, diaphoresis, palpitations, anorexia, gastrointestinal upset	6-36 hours
Delirium tremens	Delirium, tachycardia, hypertension, agitation, fever, diaphoresis	48-96 hours
Seizures	Generalized, tonic-clonic, status (rare)	6-48 hours
Alcoholic hallucinosis	Visual, auditory, and/or tactile hallucinations	12-48 hours

Workup

- CAGE questionnaire: two positive answers are about 85% sensitive, 90% specific
 - Have you felt the need to **C**ut down on your drinking?
 - Have people **A**nnoyed you when they criticize your drinking?
 - Have you ever felt bad or **G**uilty about your drinking?
 - Have you ever had a drink first thing in the morning (**E**ye opener) to steady your nerves or help with a hangover?

Comments and Treatment Considerations

For treatment of inpatient acute withdrawal, the first dose of benzodiazepine should achieve sedation without respiratory compromise; drugs then are tapered daily as long as withdrawal symptoms are stable. The combination of alcohol and benzodiazepines when coingested can be fatal, so counseling and careful patient selection are required. Inpatient treatment for withdrawal/delirium tremens (DTs) may require very large doses of benzodiazepines.

Outpatient treatment choices include:

- Chlordiazepoxide 25 to 100 mg PO/IM up to three times daily
- Diazepam 5 to 20 mg PO/IM/IV up to three times daily
- Lorazepam 1 to 4 mg PO/IM/IV every 2 to 6 hours as needed; lorazepam preferred in older adults, severe liver disease, or for IV drip
- Phenobarbital 60 to 120 mg PO/IM/IV three or four times daily may be safer in pregnancy
- Nalmefene, newer opioid antagonist, IV in U.S., odds ratio for relapse was 2:4.
- Magnesium sulfate 1 g IM/IV every 4 to 6 hours (especially if history of DTs or withdrawal seizure)



OUTPATIENT MANAGEMENT

- Naltrexone 50 mg once daily, an opioid receptor antagonist, decreases relapse and rates of withdrawal from treatment (good in primary care setting)
- Carbamazepine 800 mg/day for 7 days with good outpatient outcomes
- Gabapentin 400 mg three times daily for 3 days, 400 mg twice daily for 1 day, 400 mg once for 1 day; good results for outpatient management for withdrawal
- Topiramate up to 300 mg daily, fewer days of heavy drinking
- Acamprosate 666 mg three times daily – evidence of efficacy is unclear



ADJUNCTS TO DETOXIFICATION

- Beta-blockers for tachycardia
- Clonidine 0.1 to 0.2 mg PO three times daily for autonomic hyperactivity
- Haloperidol for psychosis, agitation



ADJUNCTS TO REHABILITATION

- Thiamine 100 mg PO/IV every day (first dose IV)
- Folic acid 1 mg PO/IV every day

- Multivitamin PO every day
- Motivational Enhancement Therapy (Project Match) has equivalent outcomes to CBT and a 12-step program (Alcoholics Anonymous) at 12 weeks.
- Studies of brief intervention and multicontact interventions show approximately 10% to 20% reduction in usage
- Alcoholics Anonymous—per person treatment cost significantly lower than outpatient treatment groups. Best long-term option.

COCAINE DEPENDENCE

In 2004, 34.2 million Americans ages 12 and over reported lifetime use of cocaine; 5.6 million reported annual use of cocaine; and 2 million Americans reported current use of cocaine. There were 1 million new users of cocaine in 2004 and most were ages 18 or older although the average age of first use was 20 years. Cocaine or stimulant intoxication can cause significant physical symptoms (Table 41-3).

Cocaine is generally not considered to cause a physical withdrawal syndrome, although there are some predictable symptoms associated with abrupt discontinuation of cocaine use.

Symptoms

- Dysphoric mood
- Fatigue, malaise

Table 41-3. Symptoms and Health Problems Associated with Cocaine Intoxication

ORGAN SYSTEM	SIGNS/SYMPTOMS	DIAGNOSES
Psychiatric	Anxiety, hallucinations, mania	Substance-induced psychosis
Neurologic	Headache, mydriasis, tremor, hyperreflexia, movement disorders, seizures, neurologic deficits	Cerebral edema, intracerebral hemorrhage, infarcts
Cardiopulmonary	Chest pain, dyspnea, syncope, hemoptysis, cough, wheezing	Cardiac ischemia, dysrhythmias, pulmonary edema, asthma, barotrauma
Gastrointestinal	Abdominal pain, nausea, vomiting	Mesenteric ischemia, bowel perforation
Renal	Polyuria, dark urine, oliguria, anuria	Acute renal failure
Other	Fever, stiffness, myalgias	Rhabdomyolysis, malignant hyperthermia

- Vivid unpleasant dreams
- Sleep disturbance
- Increased appetite
- Psychomotor retardation

Comments and Treatment Considerations

Pharmacologic treatment for cocaine addiction is widely used, despite little evidence to support its efficacy. Numerous treatments have been evaluated in large clinical trials with disappointing results.

As with other addictions, patients addicted to cocaine are more likely to remain abstinent if they complete a drug rehabilitation treatment program, including aftercare, and attend 12-step recovery groups.

HALLUCINOGENS AND DISSOCIATIVE DRUGS

Hallucinogens are the third most frequently abused class of drugs in high school students, after alcohol and marijuana (Table 41-4). Intoxication with hallucinogens causes complications that are both serotonergic and stimulant in etiology (Table 41-5).

Treatment of acute hallucinogen intoxication includes reassurance, use of benzodiazepines for the treatment of undue anxiety and agitation, and if necessary high-potency neuroleptics to treat persistent or severe symptoms of psychosis.

Symptoms

- Depression
- Memory impairment
- Anxiety
- Suicidal or homicidal ideation
- Hallucinations

Table 41-4. Commonly Abused Hallucinogens and Their Street Names

HALLUCINOGEN	STREET NAME
Lysergic acid diethylamide	LSD, acid, blotter
Phencyclidine (PCP)	Angel dust
Psilocybin	Mushrooms, magic mushrooms, shrooms
Mescaline	Peyote, cactus
3,4-Methylenedioxymethamphetamine (MDMA)	Ecstasy, X
Ketamine	Special K
Tetrahydrocannabinol (marijuana, hashish)	Mary Jane, pot, weed, dope, grass, ganja, herb

Table 41-5. Physiologic Effects of Hallucinogen Overdose

Neurologic	Mydriasis tremor, hyperreflexia, movement disorders, seizures, neurologic deficits	LSD, PCP, MDMA
Cardiopulmonary	Chest pain, dyspnea, syncope, tachycardia, elevated blood pressure	LSD, marijuana, PCP
Gastrointestinal	Nausea, vomiting	LSD, MDMA, PCP
Renal	Polyuria, dark urine, oliguria, anuria	LSD, MDMA, PCP
Other	Stiffness, myalgias, rhabdomyolysis	MDMA, PCP

Signs

- Psychosis
- Mania
- Disorientation
- Delirium

INHALANT ABUSE

Volatile substances that produce psychoactive effects, inhaled by sniffing, snorting, bagging, huffing, or spraying directly into the mouth are dangerous. In 2002 and 2003, an annual average of 718,000 youths ages 12 to 13 had used an inhalant.

**TYPES**

- Solvents—Paint thinners, dry cleaning fluids, gasoline, glue, felt pens
- Nitrites—Amyl nitrite, butyl nitrite
- Aerosols—Whipped cream containers, deodorant, and cleaning sprays
- Gases—Nitrous oxide, ether, chloroform

Symptoms

- Euphoria
- Dizziness
- Hallucinations
- Tinnitus
- Headache
- Vivid dreams

Signs

- General effects—Chemical odors on breath, intoxication
- Pulmonary—Hypoxia, pulmonary edema, pneumothorax

- Cardiovascular—Dysrhythmia, myocarditis, myocardial infarction, bradycardia
- CNS—Slurred speech, ataxia, disorientation, hallucinations, agitation, violent behavior; all have some brain damage, seizures, coma, neuropathy
- GI—Vomiting, nausea, abdominal pain
- Renal—Metabolic acidosis, calculi, nephritis
- Hematologic—Bone marrow suppression, malignancy, methemoglobinemia
- Dermatologic—Eczematoid dermatitis, erythema, pruritus
- Pregnancy and postnatal—Spontaneous abortion, premature delivery, fetal malformation
- Other—Falls, drowning, motor vehicle accidents

Workup

- CBC, BMP, ECG and cardiac monitoring
- Drug screen
- Chest x-ray
- Methemoglobin levels if nitrites suspected

Comments and Treatment Considerations

Remove the patient from the inhalant. Supplement with oxygen. Monitor for toxic effects and treat cardiac and pulmonary symptoms according to standard protocols. Recommend addiction counseling specifically for inhalants, and consider neuropsychologic testing.

MARIJUANA ABUSE

Marijuana is the most frequently used illicit drug in the United States and may predict use of harder drugs later on. The effect after smoking is short, lasting 3 to 4 hours. Chronic use may cause lung problems, cancer, reproductive effects, cognitive dysfunction, increased risk of schizophrenia, and depression.

Symptoms

- Palpitations
- Anxiety
- Depression
- Shortness of breath
- Dry mouth
- Increase in appetite
- Short-term memory loss
- Paranoia
- Reduced libido
- Galactorrhea

Signs

- Tachycardia
- Elevated BP
- Elevated respiratory rate

- Orthostatic hypotension
- Conjunctival infection
- Agitation
- Gynecomastia

WITHDRAWAL SYNDROME

Withdrawal from marijuana is not life threatening, but frequently uncomfortable, and patients may present with insomnia, agitation, tremor, or depression. COPD, cognitive dysfunction, and increase in psychiatric illness have been reported.

Workup

- Urine drug screen—Unreliable for acute intoxication
- O₂ saturation
- Chest x-ray
- ECG

Comments and Treatment Considerations

Rarely requires medical treatment. Treat psychosis if needed. Drug treatment center referral may be of benefit.

METHAMPHETAMINE

Methamphetamine is an addictive stimulant that releases high levels of dopamine, enhancing mood and body movement. Speed, meth, chalk, ice, crystal, glass, and tina are some street names. In 2004, 6.2% of high school seniors reported lifetime use of methamphetamine, unchanged from 2003. In 2008, lifetime prevalence of methamphetamine use among 18-49 year olds was 8.6%. Addiction, psychotic behavior and brain damage are effects of methamphetamine.

Rhabdomyolysis, seizures, stroke, acute coronary syndrome, ventricular dysrhythmias, and death are some of the complications.



ACUTE INTOXICATION

Symptoms

- Dizziness
- Palpitations
- Hot flashes

Signs

- Tremor
- Restlessness
- Tachycardia +++++
- Hypertension
- Euphoria or irritability
- Seizure



CHRONIC INTOXICATION

Symptoms

- Depression
- Fatigue
- Poor concentration

Signs

- Tremor
- Hypertension
- Nasal symptoms (discharge, bleeding, sniffles)



WITHDRAWAL

Abstinence syndrome: “Crash” or drastic reduction of mood and energy starts 15 to 30 minutes after cessation of binge.

Work up

- Lab work based on symptoms
 - CBC, CK, and myoglobin levels for rhabdomyolysis
 - Troponin for suspected cardiac involvement
 - Chest x-ray, CT brain scan for altered mental status

Comments and Treatment Considerations

Abrupt discontinuation: Monitor for marked depression after one-week and treat accordingly. No medications help with withdrawal or abstinence.

OPIOID DEPENDENCE

As many as 1 million people in the United States are dependent on opioids. From the IV use of heroin to prescribed narcotic analgesics, these drugs are highly reinforcing and cause physical dependence in a matter of weeks, and addiction in those vulnerable just as quickly. Opioid dependence is highly correlated with criminal activity, HIV, viral hepatitis, and depressive disorders.



OVERDOSE

Signs

- Obtundation +++++
- Hypotension +++
- Hypothermia
- Miosis
- Bradypnea +++++
- Respiratory failure

Immediate death from opioid abuse is often due to respiratory depression secondary to overdose. Increasing tolerance brings the patient closer to respiratory depression, each time the dose is increased to overcome tolerance.

Comments and Treatment Considerations

Administer naloxone 0.2 to 0.4 mg IV; repeat every 2 to 3 minutes as necessary, along with IV fluids, respiratory, and blood pressure support. Alternatively, airway management may be required.



WITHDRAWAL

Symptoms

- Dysphoric mood ++++
- Drug craving
- Insomnia
- Asthenia
- Nausea
- Anorexia, abdominal pain

Signs

- Mild elevations in pulse rate, respiratory rate, BP, and temperature
- Piloerection (gooseflesh)
- Lacrimation or rhinorrhea
- Mydriasis, yawning, diaphoresis
- Vomiting, diarrhea

Comments and Treatment Considerations

- Methadone: a pure opioid agonist restricted by federal legislation to inpatient treatment, or specialized outpatient drug treatment programs. Methadone 15 to 20 mg orally for 2 to 3 days then tapered with 10% to 15% reduction in dose daily, guided by patient's symptoms and clinical findings. Methadone maintenance for opioid dependence must be carried out in a federally licensed methadone clinic.
- Clonidine: an α -adrenergic blocker, 0.2 mg orally every 4 hours to relieve symptoms of withdrawal may be effective. Hypotension is a risk and sometimes limits the dose. It can be continued for 10 to 14 days, and tapered by the third day by 0.2 mg daily.
- Buprenorphine: this partial mu receptor agonist can be administered sublingually, in doses of 2, 4, or 8 mg every 4 hours for the management of opioid withdrawal symptoms.
- Naltrexone/clonidine: a rapid form of opioid detoxification involves pretreatment with 0.2 to 0.3 mg of clonidine followed by 12.5 mg of naltrexone (a pure opioid antagonist). Naltrexone is increased to 25 mg on the second day, 50 mg on day 3, and 100 mg on day 4, with clonidine given at 0.1 to 0.3 mg three times daily.



MAINTENANCE THERAPY

Because abstinence-based approaches have had little success in opioid dependence maintenance, therapy with methadone and now buprenorphine and naloxone combinations is often recommended.

Buprenorphine/naloxone has been approved for use in primary care clinics, and physicians who have been trained in its use may prescribe it for treatment of opioid dependence.

TOBACCO

With more than 440,000 deaths per year attributed to smoking in the United States, tobacco is the most deadly substance in our society. Tobacco is a “gateway” drug, leading adolescents to use alcohol and other addictive substances. Nearly 70% of smokers want to quit, but only 7% will be successful on their own. With counseling and medication rates increase to 35% to 40%.

The Five A's of smoking cessation ([Table 41-6](#)) is a strategy for intervention in patients with tobacco use disorders.

ASK your patient if he or she uses tobacco. When tobacco use is included as a vital sign, providers are three times more likely to discuss smoking with their patients.

ADVISE your patient to quit with a clear, strong, personalized message. Example: “As your physician I must tell you that stopping smoking is the most important thing you can do for your health. Cutting back will not be enough. Your symptoms (cough, shortness of breath, etc.) will improve when you quit.”

ASSESS your patient's willingness to make a quit attempt. Using the stages of change ([Table 41-7](#)) and the principles of motivational interviewing help your patient become ready to make a quit attempt.

ASSIST your patient by helping him or her to:

- Set a quit date
- Make a list of triggers
- Make a list of alternative behaviors
- Make a list of support persons
- Provide educational literature
- Prescribe appropriate pharmacotherapy ([Table 41-8](#))

ARRANGE for close follow-up care and monitoring.

Table 41-6. Five A's of Smoking

Ask	Every patient if they smoke
Advise	Every patient to quit
Assess	Each patient's willingness to make a quit attempt
Assist	Patients with counseling and pharmacotherapy
Arrange	Follow-up and support

Table 41-7. Stages of Change Example

Precontemplation	"I don't have a problem with smoking."
Contemplation	"I know I need to quit but am not ready."
Preparation	"I want to set a quit date."
Action	"I quit smoking."
Maintenance/relapse	"I stopped 6 months ago/I started smoking again."

Table 41-8. Pharmacotherapy for Smoking Cessation

DRUG/ DELIVERY	INITIAL DOSE	MAINTENANCE DOSE	DURATION OF THERAPY	APPROXIMATE COST/MONTH
Nicotine				
Gum 4 mg	10-15 pieces/day	5-8 pieces/ day	8 wk-5 yr	\$90
Patch	21 or 14mg daily depending on number of cigarettes smoked	Taper to next lowest dose in 4-6 wk	8-12 wk	\$115
Inhaler	4 puffs/day	4/day taper	8-12 wk	\$120
Nasal spray	5 sprays/hr	8-80 sprays/ day	8-12 wk	\$100
Bupropion	150 mg every day × 3 days	150 mg bid	7-12 wk	\$90
Varenicline	0.5 mg every day × 3 days 0.5 mg bid × 4 days	1 mg bid	12 wk	\$100

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